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EXAMINER	
ABAD, FARLEY J	

ART UNIT	PAPER NUMBER
2181	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO@HUFFMANLAW.NET

Office Action Summary	Application No.	Applicant(s)	
	10/802,532	PETTEY ET AL.	
	Examiner	Art Unit	
	FARLEY J. ABAD	2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-108* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-108* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :06/16/2004, 10/21/2004, 05/23/2005, 08/23/2005, 09/03/2005, 09/18/2005, 12/21/2005, 12/23/2005, 01/14/2006, 04/12/2006, 05/20/2006, 08/14/2006, 01/31/2007, 01/30/2008, 04/21/2008, 06/19/2008, 08/13/2008, 08/17/2008, 08/19/2008, 11/03/2008, 12/24/2008, 03/06/2009, 04/19/2009, 05/16/2009, 05/24/2009

DETAILED ACTION

Status of claims

1. Claims 1-108 are pending in the present application.

Election/Restrictions

2. Election was made **without** traverse in the reply filed on 10/22/2009 however, after examination of the elected claims (1-73), the examiner has **withdrawn** the restriction requirement due to subject matter claimed in dependent claim 27 being significantly similar to that of independent claim 74.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 06/16/2004, 10/21/2004, 05/23/2005, 08/23/2005, 09/03/2005, 09/18/2005, 12/21/2005, 12/23/2005, 01/14/2006, 04/12/2006, 05/20/2006, 08/14/2006, 01/31/2007, 01/30/2008, 04/21/2008, 06/19/2008, 08/13/2008, 08/17/2008, 08/19/2008, 11/03/2008, 12/24/2008, 03/06/2009, 04/19/2009, 05/16/2009, 05/24/2009 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

3. Claim 69 is objected to because of the following informalities: Claim 69 is dependent upon itself. The examiner recommends replacing "claim 69" with --claim 68--. Appropriate correction is required.

4. Claims 10-102 are objected to because of the following informalities: Claims 100-102 claim an apparatus however, the parent claim is directed towards a method. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 8-18, 28, 30, 33, 35-37, 38-40, 49-58, 65, 68-75, 81-88, 100, 103-108 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al (hereinafter Lee), U.S. Patent No. 6,823,458 B1.

As per claim 1, Lee discloses an apparatus [fig. 2, server 240] for sharing input/output endpoints [fig. 2, elements 280-295], the apparatus comprising:

sharing logic [fig. 3, server 240], coupled to a plurality of operating system domains [fig. 2, computers 100a and 100b] through a load-store fabric [fig. 2, connections between server 240 and client devices 210-230], for routing transactions between said plurality of operating system domains and said sharing logic [col. 6, lines 3-14, request for resource is received by server 240]; and

a first shared input/output endpoint [fig. 2, fig. 2, shared endpoints 280-295], coupled to said sharing logic [fig. 2], configured to request/complete said transactions

for said each of said plurality of operating system domains [col. 6, lines 3-14; feature is implied; e.g. a read request to a hard drive must be completed by the client receiving the data].

As per claim 2, Lee discloses the apparatus as recited in claim 1, wherein said sharing logic routes said transactions according to a protocol that provides for routing of said transactions only for a single operating system domain, and wherein said sharing logic communicates with each of said plurality of operating system domains according to said protocol [col. 3, lines 42-52].

As per claims 3 and 40, taking claim 3 as exemplary, Lee discloses the apparatus as recited in claim 1 wherein said load-store fabric comprises a point-to-point fabric [fig. 2].

As per claims 8 and 49, taking claim 8 as exemplary, Lee discloses the apparatus as recited in claim 1, wherein said load-store fabric comprises hardware, software, or a combination of hardware and software that is configured to route said transactions [fig. 2].

As per claims 9, 10, and 50-53, taking claim 9 as exemplary, Lee discloses the apparatus as recited in claim 1, wherein said transactions comprise memory read/write transactions, configured to transfer data to/from said plurality of operating system domains to/from said first shared I/O endpoint [col. 4, lines 1-4, col. 5, lines 46-53].

As per claim 11, Lee discloses the apparatus as recited in claim 1, wherein said transactions comprise message transactions, configured to direct said first shared I/O endpoint to perform a specified operation [col. 4, lines 1-4; col. 5, lines 46-53].

As per claims 12 and 13, Lee discloses wherein said first shared input/output endpoint comprises a shared network interface controller (NIC)/shared Ethernet controller [col. 4, lines 4-6].

As per claims 14-15 and 54-55, taking claims 14-15 as exemplary, Lee discloses wherein said one of said one or more I/O endpoints comprises a Fiber Channel controller, shared RAID controller, shared, I/O switch [col. 4, lines 1-4, col. 5, lines 46-53].

As per claims 16-18 and 56-58, taking claims 16-18 as exemplary, Lee discloses wherein said first shared input/output endpoint is integrated into a shared I/O switch, is integrated into a root complex, is integrated into a processing complex [col. 4, lines 1-4, col. 5, lines 46-53].

As per claims 28 and 68, taking claim 28 as exemplary**,** Lee discloses the apparatus as recited in claim 1, wherein said shared I/O endpoint designates one of said transactions for a particular one of said plurality of operating system domains by encapsulating an OS domain header within a transaction layer packet, and wherein said transaction layer packet is routed to said sharing logic [col. 6, lines 3-21; feature is implied; e.g. a read request to a hard drive must be completed by the client receiving the data].

As per claims 30 and 65, taking claim 30 as exemplary**,** Lee discloses the apparatus as recited in claim 1, wherein said sharing logic comprises a shared I/O switch [fig. 1, server 240 performs the same functions of an I/O switch by routing the requests to the intended destination].

As per claim 33, Lee discloses the apparatus as recited in claim 1 further comprising:

a second shared input/output endpoint, coupled to said sharing logic, configured to request/complete additional transactions for a subset of said plurality of operating system domains [col. 6, lines 14-45].

As per claim 35, Lee discloses the apparatus as recited in claim 1 further comprising:

second sharing logic, coupled to said sharing logic and to a second shared input/output endpoint, configured route said transactions between said plurality of operating system domains and said second shared input/output endpoint [fig. 2; col. 6, lines 14-45].

As per claim 36, Lee discloses the apparatus as recited in claim 1 further comprising:

second sharing logic, coupled to said sharing logic, a second shared input/output endpoint, and one of said plurality of operating system domains, configured route said transactions between said one of said plurality of operating system domains and said second shared I/O endpoint, and between said one of said plurality of operating system domains and said sharing logic [fig. 2; col. 6, lines 14-45].

As per claim 37, Lee discloses The apparatus as recited in claim 1 further comprising: second sharing logic, coupled to said sharing logic and one or more additional operating system domains, configured to route said transactions between

said one or more additional operating system domains and said sharing logic [fig. 2; col. 6, lines 14-45].

As per claim 38, Lee discloses a shared input/output (I/O) mechanism, comprising:

a load-store fabric [fig. 2, all elements and connections except 210-230], configured to enable operating system domains [fig. 2, client devices 210-230] to share one or more I/O endpoints [fig. 2, fig. 2, sharing 280-295], said load-store fabric comprising:

sharing logic [fig. 2, all elements except 210-230], coupled to said operating system domains and to said one or more I/O endpoints [fig. 2], for routing first transactions to/from said operating systems domains [col. 6, lines 3-14], and for routing second transactions to/from said one or more I/O endpoints [col. 6, lines 3-21; feature is implied; e.g. a read request to a hard drive must be completed by the client receiving the data], wherein each of said second transactions designates an associated one of said operating system domains for which an operation specified by each of said first transactions be performed [col. 6, lines 3-21; feature is implied; e.g. a read request to a hard drive must be completed by the client receiving the data].

As per claim 39, Lee discloses the shared I/O mechanism as recited in claim 38, wherein , wherein said first transactions comport with a protocol that provides exclusively for a single operating system domain within said load-store fabric [col. 3, lines 42-52].

As per claim 69, Lee discloses the shared I/O mechanism as recited in claim 69, wherein said sharing logic is configured to detect and decapsulate said OS domain header from said transaction layer packet, and configured to route a corresponding one of said first transactions to said particular one of said plurality of operating system domains according to a protocol that provides exclusively for a single operating system domain within said load-store fabric [fig. 2; col. 6, lines 14-45]..

As per claim 70, Lee discloses The shared I/O mechanism as recited in claim 38, wherein one of said one or more I/O endpoints is configured to be shared with a first subset of said operating system domains, and wherein a second one of said one or more I/O endpoints is configured to be shared with a second subset of said operating system domains [fig. 2; col. 6, lines 14-45].

As per claim 71, Lee discloses the shared I/O mechanism as recited in claim 38, further comprising:

second sharing logic, coupled to said sharing logic and to second one or more I/O endpoints, configured route said first transactions, and configured to route third transactions to/from said second one or more I/O endpoints, wherein each of said third transactions designates a second associated one of said operating system domains for which a second operation specified by each of said first transactions be performed [fig. 2; col. 6, lines 14-45; feature is implied; e.g. a read request to a hard drive must be completed by the client receiving the data].

As per claim 72, Lee discloses The shared I/O mechanism as recited in claim 38, further comprising: second sharing logic, coupled to said sharing logic [fig. 2; col. 6,

lines 14-45] second one or more I/O endpoints, and one of said operating system domains, configured route said first transactions [fig. 2; col. 6, lines 14-45] and configured to route third transactions to/from said second one or more I/O endpoints and to/from said sharing logic [fig. 2; col. 6, lines 14-45] wherein each of said third transactions designates a second associated one of said operating system domains for which a second operation specified by each of said first transactions be performed [fig. 2; col. 6, lines 14-45].

As per claim 73, Lee discloses the shared I/O mechanism as recited in claim 38, further comprising:

second sharing logic, coupled to said sharing logic and one or more additional operating system domains [fig. 2; col. 6, lines 14-45] configured route third transactions between said one or more additional operating system domains and said sharing logic [fig. 2; col. 6, lines 14-45] said third transactions comporting with a protocol that provides exclusively for a single operating system domain within said load-store fabric [fig. 2; col. 6, lines 14-45] and configured to route fourth transactions to/from said sharing logic [fig. 2; col. 6, lines 14-45] wherein each of said fourth transactions designates a corresponding one of said one or more additional operating system domains for which a second operation is to be performed by said one or more I/O endpoints [fig. 2; col. 6, lines 14-45].

As per claim 74,Lee discloses a method for sharing an input/output (I/O) endpoint within a load-store fabric, comprising:

via sharing logic [fig. 1, all elements except clients 110-130] within the load-store fabric [fig. 1, all elements except clients 110-130], interconnecting operating system domains [fig. 1, clients 110-130] to the I/O endpoint [fig. 1, resources 140-160 contained in physical device 100];

first communicating with each of the operating system domains individually [col. 2, lines 15-21, resources 280-295 communicating with each of the clients be returning requested data]; and

second communicating with the I/O endpoint according to a variant of a protocol [col. 3, lines 44-47] that provides exclusively for a single operating system domain within the load-store fabric to enable the I/O endpoint to associate a prescribed operation with a corresponding one of the operating system domains [col. 4, lines 7-25, client makes a request through the load-store fabric to enable the resource to enable the physical device 100 to associate a lock operation with a corresponding client].

As per claim 75, Lee discloses the method as recited in claim 74, wherein said interconnecting comprises:

coupling the operating system domains to the I/O endpoint over a point-to-point fabric [fig. 1].

As per claim 81, Lee discloses the method as recited in claim 74, wherein said first communicating comprises:

issuing a memory read transaction directing that data be transferred to one of the operating system domains from the I/O endpoint [col. 4, lines 1-6, feature is implied, reading from a cd-rom or hard disk].

As per claim 82, Lee discloses the method as recited in claim 74, wherein said first communicating comprises:

issuing a memory write transaction directing that data be transferred from one of the operating system domains to the I/O endpoint [col. 4, lines 1-6, feature is implied, writing to a cd-rom or hard disk].

As per claim 83, Lee discloses the method as recited in claim 74, wherein said first communicating comprises:

issuing a message transaction directing that the I/O endpoint perform a prescribed operation associated with one of the operating system domains [col. 4, lines 1-6, performing a read or write operation which is associated with the requestor].

As per claim 84, Lee discloses the method as recited in claim 74, wherein the I/O endpoint comprises a shared network interface controller (NIC) [fig. 2, server 240].

As per claim 85, Lee discloses the method as recited in claim 84, wherein the shared NIC comprises a shared Ethernet controller [fig. 2, server 240].

As per claim 86, Lee discloses the method as recited in claim 74, wherein the I/O endpoint comprises a Fiber Channel controller [col. 4, lines 1-4, col. 5, lines 46-53].

As per claim 100, Lee discloses The apparatus as recited in claim 74, wherein the sharing logic comprises a shared I/O switch [col. 4, lines 1-4, col. 5, lines 46-53].

As per claim 106, Lee discloses The method as recited in claim 74, further comprising:

third communicating with a second I/O endpoint

according to the variant of the protocol to enable the second I/O endpoint to associate specified operations with a corresponding one of a subset of the operating system domains [col. 4, lines1-16, associating operations with a client by locking the resource allowing only the client to perform operations].

As per claim 107, Lee discloses The method as recited in claim 74, further comprising:

via second sharing logic within the load-store fabric, second interconnecting additional operating system domains to the sharing logic, whereby the additional operating system domains can share the I/O endpoint [fig. 2].

As per claim 108, Lee discloses he method as recited in claim 74, further comprising:

via second sharing logic within the load-store fabric, second interconnecting the operating system domains to the sharing logic and to a second I/O endpoint [fig. 2].

As per claims 87 and 88, Lee discloses wherein said one of said one or more I/O endpoints comprises a shared RAID controller, shared I/O switch [col. 4, lines 1-4, col. 5, lines 46-53].

As per claim 103, Lee discloses within the I/O endpoint, designating a transaction for a particular one of the operating system domains by embedding an OS domain header within a transaction layer packet; and

first routing the transaction layer packet to the sharing logic [fig. 1; col. 4, lines 65-67; col. 5, lines 1-2].

As per claim 104, Lee discloses within the sharing logic, detecting and removing the OS domain header from the transaction layer packet [fig. 1; col. 4, lines 65-67; col. 5, lines 1-2].

As per claim 105, Lee discloses The method as recited in claim 104, wherein said first communicating comprises:

second routing the transaction layer packet to the particular one of the operating system domains according to the protocol [col. 3, lines 44-47; fig. 1].

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 4-7, 19-27, 29, 31-32, 34, 41-48, 59-64, 66-67, 76-80, 89-99, 101, and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee, and further in view of Harriman, U.S. Publication No. 2003/0123484 A1.

As per claims 4, 45, and 77, taking claim 4 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim 1, wherein said sharing logic maps said each of said plurality of operating system domains to a corresponding root complex.

However, Harriman discloses wherein said sharing logic maps said each of said plurality of operating system domains to a corresponding root complex [paragraph 0023].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said sharing logic maps said each of said plurality of operating system domains to a corresponding root complex because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 5, 46, and 78, taking claim 5 as exemplary**,** Lee does not explicitly disclose the apparatus as recited in claim 4, wherein said corresponding root complex is associated with one or more processing complexes, each comprising:

a processing core, configured to process data, wherein said processing core accesses a memory that is configured to store said data.

However, Harriman discloses wherein said corresponding root complex is associated with one or more processing complexes, each comprising:

a processing core, configured to process data, wherein said processing core accesses a memory that is configured to store said data [paragraph 0023].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said corresponding root complex is associated with one or more processing complexes, each comprising: a processing core, configured to process data, wherein said processing core accesses a memory that is configured to store said data because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 6, 46, and 79-80, taking claim 6 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim 5, wherein said data is transferred

from said corresponding root complex to said sharing logic according to a protocol that provides for routing of said transactions only for a single operating system domain.

However, Harriman discloses wherein said data is transferred from said corresponding root complex to said sharing logic according to a protocol that provides for routing of said transactions only for a single operating system domain [paragraph 0021].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said data is transferred from said corresponding root complex to said sharing logic according to a protocol that provides for routing of said transactions only for a single operating system domain because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 7 and 48, taking claim 7 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim 5, wherein said data is transferred to said root complex from said sharing logic according to a protocol that provides for routing of said transactions only for a single operating system domain.

However, Harriman discloses wherein said data is transferred to said root complex from said sharing logic according to a protocol that provides for routing of said transactions only for a single operating system domain [paragraph 0021].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said data is transferred to said root complex from said sharing logic according

to a protocol that provides for routing of said transactions only for a single operating system domain because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 19 and 42, taking claim 19 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim, wherein said protocol comprises PCI Express.

However, Harriman discloses wherein said protocol comprises PCI Express [paragraph 0021].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said protocol comprises PCI Express because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 20 and 43, taking claim 20 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim 19, wherein said sharing logic isolates said transactions over a plurality of PCI Express bus hierarchies according to each of said plurality of operating system domains.

However, Harriman discloses wherein said sharing logic isolates said transactions over a plurality of PCI Express bus hierarchies according to each of said plurality of operating system domains [paragraphs 0021, 0048].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said sharing logic isolates said transactions over a plurality of PCI Express bus

hierarchies according to each of said plurality of operating system domains because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 21 and 44, taking claim 21 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim 20, wherein a subset of said transactions are routed in accordance with addressing mechanisms for a particular one of said plurality of PCI Express bus hierarchies, said particular one of said plurality of PCI Express bus hierarchies corresponding to a particular one of said plurality of operating system domains.

However, Harriman discloses wherein a subset of said transactions are routed in accordance with addressing mechanisms for a particular one of said plurality of PCI Express bus hierarchies, said particular one of said plurality of PCI Express bus hierarchies corresponding to a particular one of said plurality of operating system domains [paragraphs 0021, 0048].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein a subset of said transactions are routed in accordance with addressing mechanisms for a particular one of said plurality of PCI Express bus hierarchies, said particular one of said plurality of PCI Express bus hierarchies corresponding to a particular one of said plurality of operating system domains because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 22 and 59, taking claim 22 as exemplary, Lee does not explicitly disclose The apparatus as recited in claim I, wherein said sharing logic is configured to

associate each of said transactions with a corresponding one of said plurality of operating system domains (OSDs), said corresponding one of said plurality of OSDs corresponding to one or more root complexes.

However, Harriman discloses wherein said sharing logic is configured to associate each of said transactions with a corresponding one of said plurality of operating system domains (OSDs), said corresponding one of said plurality of OSDs corresponding to one or more root complexes [paragraphs 0023, 0025].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said sharing logic is configured to associate each of said transactions with a corresponding one of said plurality of operating system domains (OSDs), said corresponding one of said plurality of OSDs corresponding to one or more root complexes because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 23 and 60, taking claim 23 as exemplary**,** Lee does not explicitly disclose wherein said plurality of OSDs comprises 16 OSDs.

However, Lee discloses wherein said plurality of OSDs comprises 3 OSDs.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement 16 OSDs because the number of OSDs is simply a matter of choice and it is well within the technical skill of an artisan to implement 16 OSDs since Lee discloses implementing 3 OSDs.

As per claims 24 and 61, taking claim 24 as exemplary, Lee discloses the apparatus as recited in claim 22, wherein said sharing logic designates said corresponding one of said plurality of OSDs according to a variant of a protocol that provides for routing of said transactions only for a single operating system domain [col. 3, lines 43-48].

As per claims 25 and 62, taking claim 25 as exemplary, Lee discloses the apparatus as recited in claim 24, wherein said variant comprises encapsulating an OS domain header within a transaction layer packet that otherwise comports with said protocol [col. 4, lines 65-67; col. 5, lines 1-2].

As per claims 26 and 62, taking claim 26 as exemplary, Lee discloses the apparatus as recited in claim 25, wherein said transaction layer packet is routed between said sharing logic and said first shared I/O endpoint [fig. 2, connections between clients and server].

As per claims 27 and 64, Lee discloses the apparatus as recited in claim 26, wherein said first shared I/O endpoint is configured to detect said OS domain header and to perform a specified operation according to said protocol exclusively for said one of said plurality of OSDs [col. 4, lines 37-44].

As per claim 29, Lee discloses the apparatus as recited in claim 28, wherein said sharing logic is configured to detect and decapsulate said OS domain header from said transaction layer packet, and is configured to route said one of said transactions to said particular one of said plurality of operating system domains according to protocol

that provides for routing of said transactions only for a single operating system domain [col. 4, lines37-44].

As per claims 31, 32, 66, and 67, taking claims 31 and 32 as exemplary, Lee does not explicitly disclose the apparatus as recited in claim 1, wherein said sharing logic is integrated within a root complex/ processing complex.

However, Harriman discloses wherein said sharing logic is integrated within a root complex/ processing complex [fig. 1].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said sharing logic is integrated within a root complex/ processing complex because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 34, Lee does not explicitly disclose the apparatus as recited in claim 33, wherein said sharing logic is configured to associate each of said additional transactions with one of a plurality of root complexes, said one of a plurality of root complexes corresponding to one of said subset of said plurality of operating system domains.

However, Harriman discloses wherein said sharing logic is configured to associate each of said additional transactions with one of a plurality of root complexes, said one of a plurality of root complexes corresponding to one of said subset of said plurality of operating system domains [paragraphs 0020, 0021, 0025].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said sharing logic is configured to associate each of said additional transactions with one of a plurality of root complexes, said one of a plurality of root complexes corresponding to one of said subset of said plurality of operating system domains because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 41, Lee does not explicitly disclose the shared I/O mechanism as recited in claim 38, wherein said load-store fabric comprises a bus.

However, Harriman discloses wherein said load-store fabric comprises a bus [paragraph 0023].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the apparatus of Lee to include wherein said load-store fabric comprises a bus because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 76, Lee does not explicitly disclose the method as recited in claim 74, wherein said interconnecting comprises:

coupling root complexes to the I/O endpoint over a bus.

However, Harriman discloses coupling root complexes to the I/O endpoint over a bus [paragraph 0023].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include

coupling root complexes to the I/O endpoint over a bus because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claims 89 and 90, Lee does not explicitly disclose The method as recited in claim 74, wherein the I/O endpoint is integrated into a root complex, is integrated into a processing complex.

However, Harriman discloses wherein the I/O endpoint is integrated into a root complex, is integrated into a processing complex [col. 4, lines 1-4, col. 5, lines 46-53].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Srinivasan to include wherein the I/O endpoint is integrated into a root complex, is integrated into a processing complex because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 91, Lee does not explicitly disclose the method as recited in claim 74, wherein said first communicating comprises: employing PCE Express as the protocol.

However, Harriman discloses w wherein said first communicating comprises: employing PCE Express as the protocol [paragraph 0021].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include wherein said first communicating comprises: employing PCE Express as the protocol because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 92, Lee does not explicitly disclose the method as recited in claim 91, further comprising:

isolating transactions over a plurality of PCI Express bus hierarchies according to each of the operating system domains.

However, Harriman discloses isolating transactions over a plurality of PCI Express bus hierarchies according to each of the operating system domains [paragraphs 0021, 0048].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include isolating transactions over a plurality of PCI Express bus hierarchies according to each of the operating system domains because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 93, Lee does not explicitly disclose the method as recited in claim 92, further comprising: routing the transactions in accordance with addressing mechanisms for a particular one of the plurality of PCI Express bus hierarchies, the particular one of said plurality of PCI Express bus hierarchies corresponding to the corresponding one of the operating system domains.

However, Harriman discloses routing the transactions in accordance with addressing mechanisms for a particular one of the plurality of PCI Express bus hierarchies, the particular one of said plurality of PCI Express bus hierarchies corresponding to the corresponding one of the operating system domains [paragraphs 0021, 0048].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include routing the transactions in accordance with addressing mechanisms for a particular one of the plurality of PCI Express bus hierarchies, the particular one of said plurality of PCI Express bus hierarchies corresponding to the corresponding one of the operating system domains because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 94, Lee does not explicitly disclose the method as recited in claim 74, wherein said first communicating comprises: associating the each of the operating system domains with of a plurality of root complexes.

However, Harriman discloses wherein said first communicating comprises: associating the each of the operating system domains with of a plurality of root complexes [paragraphs 0023, 0025].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include wherein said first communicating comprises: associating the each of the operating system domains with of a plurality of root complexes because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 95, Lee does not explicitly disclose wherein the plurality of operating system domains comprises 16 operating system domains.

However, Srinivasan discloses wherein a plurality of OSDs [col. 5, lines 23-27].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement 16 OSDs because the number of OSDs is simply a matter of choice and it is well within the technical skill of an artisan to implement 16 OSDs since Srinivasan discloses implementing a plurality of OSDs.

As per claim 96, Lee does not explicitly disclose The method as recited in claim 74, wherein said second communicating comprises:

employing the variant of the protocol to associate a unique root complex that with the corresponding one of the operating system domains.

However, Harriman discloses employing the variant of the protocol to associate a unique root complex that with the corresponding one of the operating system domains [paragraphs 0020, 0021, 0025].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include employing the variant of the protocol to associate a unique root complex that with the corresponding one of the operating system domains because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

As per claim 97, Lee discloses encapsulating an OS domain header within a transaction layer packet that otherwise comports with the protocol, wherein the value of the OS domain header designates the corresponding one of the operating system domains [col. 4, lines 26-35].

As per claim 98, Lee discloses The method as recited in claim 97, wherein said second communicating further comprises:

routing the transaction layer packet between the sharing logic and the I/O endpoint [fig. 2].

As per claim 99, Lee discloses The method as recited in claim 98, wherein said second communicating further comprises:

within the I/O endpoint, detecting the OS domain header; and

performing the prescribed operation according to the protocol, wherein said performing is accomplished exclusively for the corresponding one of the operating system domains [col. 4, lines 27-44].

As per claims 101 and 102, Lee does not explicitly disclose wherein said sharing logic is integrated within a root complex/ processing complex.

However, Harriman discloses wherein said sharing logic is integrated within a root complex/ processing complex [fig. 1].

One of ordinary skill in the art at the time of applicant's invention would have clearly recognized that it is quite advantageous for the method of Lee to include wherein said sharing logic is integrated within a root complex/ processing complex because it would provide the enhanced capability of avoiding data loss [paragraph 0005].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FARLEY J. ABAD whose telephone number is (571) 270-3425. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alford Kindred can be reached on (571) 272-4037. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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